

Trend Study 16A-9-02

Study site name: Birch Creek.

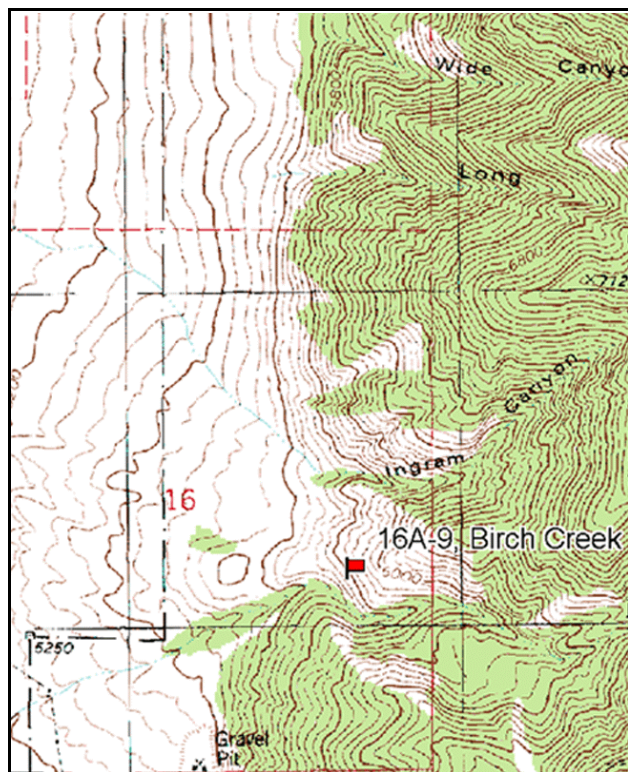
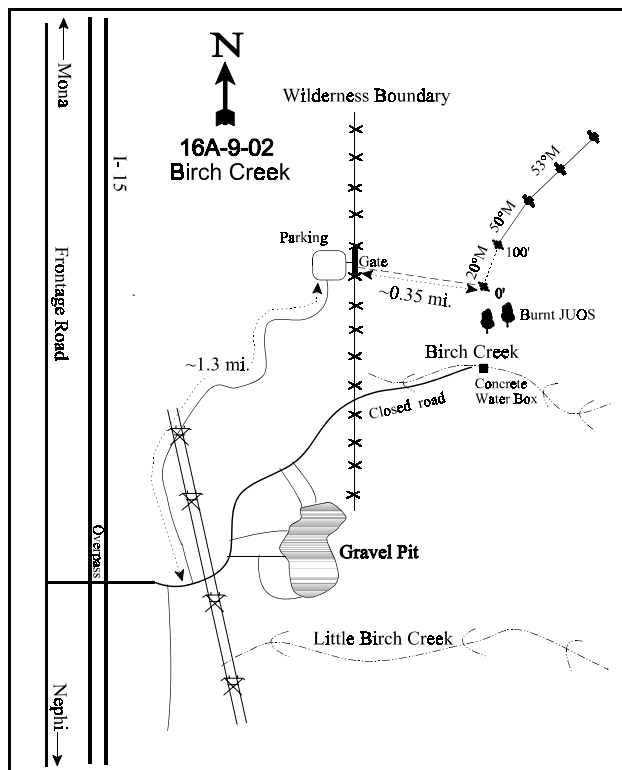
Vegetation type: Mountain Brush.

Compass bearing: frequency baseline 20 degrees magnetic (line 2 @ 50°M, line 3-4 @ 53°M).

Frequency belt placement: line 1 (11 & 95ft), line 2 (59ft), line 3 (34ft), line 4 (71ft).

LOCATION DESCRIPTION

Beginning at the overpass where the road to Little Birch Canyon passes over I-15 (north of the northernmost Nephi exit), take the first left just before the powerlines cross the road. Proceed about 1.3 miles east-northeast to a parking lot. From the wilderness boundary, walk east for about 0.35 miles to the 0-foot stake. The 0-foot baseline stake is near a cliffrose bush on a small trail running parallel along the bench. Browse tag #3961 marks the 0-foot baseline stake.

Map Name: MonaTownship 12S, Range 1E, Section 16

Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4402134 N 429657 E

DISCUSSION

Birch Creek - Trend Study No. 16A-9

The Birch Creek study is located on a very steep (70%), south facing slope at the mouth of Little Birch Creek. Elevation is approximately 5,680 feet. The original baseline sampled a more level bench with a slope of about 30%. The lengthened baseline extends up a steeper slope with the same aspect and vegetation type. Range type is a sparse mixture of mountain brush that is seriously depleted of ground cover and forage. Water is available in Birch Creek about 150 yards down slope from the baseline. The area is considered critical deer and elk winter range. Deer and elk pellet groups were common on the site in 1997 with a quadrat frequency of 30% for elk and 15% for deer. A fire burned the entire area in 2001, the same fire which burned near the Willow Creek site. The fire did not burn particularly hot on the study site and the end of the baseline was unburned leaving some healthy browse intact. Wildlife still utilize the area, and data from a pellet group transect read along the study site baseline in 2002 estimated 44 deer and 20 elk days use/acre (109 ddu/ha and 50 edu/ha).

The area possesses a shallow and extremely rocky soil which is eroded to the point where little bare soil remains. Parent material is limestone with numerous rock outcrops on the site. The site is terraced and some steeper areas have a complete cover of rock talus. Even with the rockiness of the soil, effective rooting depth is estimated at nearly 14 inches. Texture is a sandy loam with a neutral pH of 7.1. Percent organic matter in the soil is much higher at 3.1% than nearby study site #7 and #8 (1.8% and 1.6% respectively). Some erosion is occurring due to the steepness of the slope. The erosion condition classification was determined as slight in 2002.

The site supports three key browse species, mountain big sagebrush, serviceberry, and Stansbury cliffrose. Sagebrush occurred in small numbers in 1997 with an estimated density of only 360 plants/acre. Utilization of the sagebrush was moderate to heavy but vigor was normal on all plants and there were no decadent plants. After the burn, most of the sagebrush have been eliminated. In 2002, only 80 sagebrush plants/acre were estimated, most of which were decadent. Serviceberry is the most numerous shrub on the site with an estimated density of 640 plants/acre in 1997. Most of the serviceberry on the site burned, but most had resprouted in 2002. Resprouted plants were all classified as young plants numbering 1,240 plants/acre in 2002.

Cliffrose made up 28% of the browse cover with a small population of only 180 plants/acre in 1997. Nearly 80% of the population consisted of large mature plants which averaged over 5 feet in height. The height of these taller plants resulted in many of them being unavailable to browsing. After the fire, only a few (60 plants/acre) cliffrose up slope at the end of the baseline were left unburned. Utilization of cliffrose has been consistently heavy with mostly moderate use in 1989. Recruitment is poor and percent decadence is currently 33%.

Other preferred browse include black sagebrush, fourwing saltbush, and true mountain mahogany. These species occur in very limited numbers after the fire. The increasers, narrowleaf low rabbitbrush and broom snakeweed are found on the site in small numbers as well.

The herbaceous understory is depleted with grasses and forbs combining to produce less than 20% cover. Cheatgrass is abundant and accounted for 46% of the grass cover in 1997, increasing to 63% in 2002 after the fire. Bluebunch wheatgrass is the only abundant perennial grass. It made up just over half of the grass cover (53%) in 1997, declining to 24% in 2002. Perennial forbs are lacking. The only common perennial species include shortstem wild buckwheat and northern sweetvetch. Annual forbs are abundant and dominate the forb component of the herbaceous understory. The most common species include pale alyssum and storksbill.

1983 APPARENT TREND ASSESSMENT

A fundamental problem on this site is accelerated erosion and the resultant loss of topsoil. Soil condition is very poor and unlikely to improve without some kind of direct manipulation. Vegetative trend appears to be headed toward a relatively barren site populated principally by annual grasses, forbs, and perennial weeds. The most desirable browse plants are heavily utilized and not adequately reproducing.

1989 TREND ASSESSMENT

Ground cover values indicate no significant changes, although the soil remains unstable with extensive erosion pavement. As with other winter ranges in the area, the site is limited by poor soil conditions on steep slopes and by heavy browse utilization. On the density plots, mountain big sagebrush makes up 1/3 of the browse composition. It decreased 36% in density with half as many mature sagebrush counted in 1989. They have a moderately to heavily hedged growth form from recent use. The current age class structure indicates a stable population for sagebrush. The density data suggests a decline of serviceberry. However, this species is often difficult to count. Comparing other factors, the decline does not appear to be significant. Density data for other browse species on the site show that sumac increased while cliffrose and juniper are unchanged. While the diversity of grasses and forbs remains low, bluebunch wheatgrass increased significantly in nested frequency. Utah sweetvetch remains the most frequent perennial forb.

TREND ASSESSMENT

soil - stable, but in poor condition (3)

browse - stable for key species (3)

herbaceous understory - up, but poor (5)

1997 TREND ASSESSMENT

Trend for soil is stable. Cover of bare ground increased slightly and litter cover declined. Rock and pavement cover also increased from 45% to 57%. Some of these differences are likely due to the lengthened baseline which samples a steeper slope. There is some erosion occurring due to the steep slope. However, there is still abundant protective ground cover to prevent serious erosion. Trend for browse appears stable for the key species, serviceberry, mountain big sagebrush, and cliffrose. Utilization is heavier, but percent decadence is lower than that found in 1989. Density of these preferred shrubs is still low and recruitment is poor. Trend for the herbaceous understory is down slightly due to a decline in the sum of nested frequency of perennial grasses and forbs. Annual grasses and forbs currently provide 52% of the herbaceous cover. Bluebunch wheatgrass and Sandberg bluegrass declined in their sum of nested frequency values.

TREND ASSESSMENT

soil - stable but poor (3)

browse - stable (3)

herbaceous understory - slightly down (2)

2002 TREND ASSESSMENT

Trend for soil is down slightly due to an increase in cover of bare ground and a decline in litter and vegetation cover due to fire. However, due to the abundant rock and pavement cover (60%), there is not a lot of unprotected bare ground exposed (13%), and the erosion condition classification was determined as slight in 2002. Trend for the key browse is also down due to the fire which burned the site in 2001. Most of the shrubs were burned on the site with the exception of shrubs on the steeper part of the slope. Only 60 cliffrose per acre remain. These are all heavily browsed, in good vigor, with 1/3 decadent. Most of the mountain big sagebrush population was eliminated by the fire. Serviceberry has resprouted with a density of 1,240 young plants per acre. Trend for the herbaceous understory is also down slightly due to a significant decline in bluebunch wheatgrass which remains the most abundant perennial species. The annual, cheatgrass, remains the dominant herbaceous species. It provides 63% of the total grass cover and 49% of the total herbaceous cover. Perennial forbs are still lacking.

TREND ASSESSMENT

soil - down slightly (2)

browse - down due to fire (1)

herbaceous understory - down slightly (2)

HERBACEOUS TRENDS --

Herd unit 16A, Study no: 9

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
G	Agropyron spicatum	_b 188	_c 259	_{bc} 215	_a 141	71	90	84	58	7.00	4.89
G	Bromus japonicus (a)	-	-	_a -	_b 45	-	-	-	17	-	.15
G	Bromus tectorum (a)	-	-	292	276	-	-	93	88	6.13	9.72
G	Poa secunda	_a 4	_c 75	_b 23	_{bc} 54	2	31	13	23	.14	.63
Total for Annual Grasses		0	0	292	321	0	0	93	105	6.13	9.88
Total for Perennial Grasses		192	334	238	195	73	121	97	81	7.14	5.53
Total for Grasses		192	334	530	516	73	121	190	186	13.27	15.42
F	Alyssum alyssoides (a)	-	-	_b 237	_a 190	-	-	79	68	2.66	1.20
F	Allium spp.	-	-	-	3	-	-	-	1	-	.03
F	Arabis spp.	-	-	1	-	-	-	1	-	.00	-
F	Artemisia ludoviciana	2	-	3	3	1	-	1	1	.03	.03
F	Castilleja linariaefolia	-	-	3	-	-	-	1	-	.00	-
F	Camelina microcarpa (a)	-	-	-	3	-	-	-	1	-	.00
F	Calochortus nuttallii	3	-	2	1	1	-	1	1	.00	.00
F	Cirsium spp.	-	-	6	-	-	-	2	-	.01	-
F	Comandra pallida	-	7	-	-	-	2	-	-	-	-
F	Collinsia parviflora (a)	-	-	-	3	-	-	-	1	-	.00
F	Descurainia pinnata (a)	-	-	9	20	-	-	5	11	.02	.10
F	Epilobium brachycarpum (a)	-	-	-	1	-	-	-	1	-	.00
F	Eriogonum brevicale	-	2	8	10	-	2	5	4	.73	.48
F	Erodium cicutarium (a)	-	-	_a 23	_b 42	-	-	8	17	.09	1.39
F	Galium aparine (a)	-	-	57	57	-	-	26	25	.83	.22

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
F	Gilia spp. (a)	-	-	_a 9	_b 19	-	-	3	9	.01	.11
F	Hackelia patens	2	6	-	-	1	2	-	-	-	-
F	Hedysarum boreale	_b 27	_b 31	_b 21	_a 2	13	17	10	1	.77	.18
F	Holosteum umbellatum (a)	-	-	-	9	-	-	-	5	-	.02
F	Lappula occidentalis (a)	-	-	6	7	-	-	2	4	.01	.04
F	Lactuca serriola	-	-	-	2	-	-	-	1	-	.03
F	Lygodesmia grandiflora	_{ab} 7	_b 18	_a -	_a -	3	6	-	-	-	-
F	Machaeranthera canescens	-	9	10	-	-	4	4	-	.04	-
F	Phacelia linearis	_a -	_a -	_a -	_b 68	-	-	-	30	-	.52
F	Phlox longifolia	-	11	2	5	-	6	1	3	.00	.06
F	Ranunculus testiculatus (a)	-	-	-	5	-	-	-	2	-	.01
F	Streptanthus cordatus	-	-	5	1	-	-	2	1	.15	.00
F	Tragopogon dubius	2	-	1	-	1	-	1	-	.00	-
F	Unknown forb-annual (a)	-	-	_b 33	_a -	-	-	17	-	.08	-
Total for Annual Forbs		0	0	374	356	0	0	140	144	3.73	3.14
Total for Perennial Forbs		43	84	62	95	20	39	29	43	1.78	1.35
Total for Forbs		43	84	436	451	20	39	169	187	5.51	4.49

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --

Herd unit 16A, Study no: 9

Type	Species	Strip Frequency		Average Cover %	
		'97	'02	'97	'02
B	Amelanchier alnifolia	16	16	1.91	1.05
B	Artemisia nova	5	0	-	-
B	Artemisia tridentata vaseyana	15	4	.89	.03
B	Atriplex canescens	1	0	-	-
B	Brickellia californica	2	0	.85	-
B	Cercocarpus montanus	2	1	1.00	.15
B	Chrysothamnus viscidiflorus stenophyllus	3	3	.00	.03
B	Cowania mexicana stansburiana	8	3	3.01	1.06
B	Gutierrezia sarothrae	7	2	-	-
B	Juniperus osteosperma	2	0	2.89	-
B	Rhus trilobata	0	2	-	-
Total for Browse		61	31	10.57	2.32

CANOPY COVER --
Herd unit 16A, Study no: 9

Species	Percent Cover	
	'97	'02
Amelanchier alnifolia	1.8	-
Cowania mexicana stansburiana	1.0	-
Juniperus osteosperma	5	-

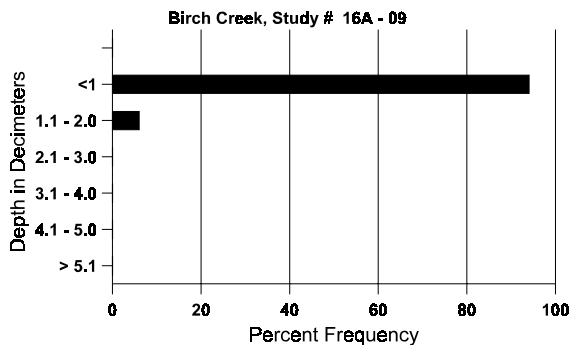
BASIC COVER --
Herd unit 16A, Study no: 9

Cover Type	Nested Frequency		Average Cover %			
	'97	'02	'83	'89	'97	'02
Vegetation	333	318	2.00	8.50	26.68	22.07
Rock	357	381	26.25	41.25	48.14	51.06
Pavement	200	291	25.50	3.25	9.28	9.39
Litter	361	352	44.50	42.25	26.36	19.13
Cryptogams	31	2	.25	1.50	.88	.00
Bare Ground	154	212	1.50	3.25	7.58	13.19

SOIL ANALYSIS DATA --
Herd Unit 16A, Study no: 09, Birch Creek

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%OM	PPM P	PPM K	dS/m
13.8	55.5 (12.9)	7.1	54.4	30.1	15.6	3.1	9.7	80.0	.7

Stoniness Index



PELLET GROUP FREQUENCY --
Herd unit 16A, Study no: 9

Type	Quadrat Frequency		Pellet Transect	
	'97	'02	Pellet Groups per Acre '02	Days Use per Acre (ha) '02
Rabbit	-	-	-	-
Elk	30	12	261	20 (50)
Deer	15	25	574	44 (109)

BROWSE CHARACTERISTICS --

Herd unit 16A, Study no: 9

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total									
		1	2	3	4		5	6		7	8	9	1	2	3	4		
Amelanchier alnifolia																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	4	2	-	-	-	-	-	-	-	6	-	-	-	200			6
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	97	2	8	-	3	-	-	-	-	-	13	-	-	-	260			13
	02	60	-	-	-	-	-	2	-	-	62	-	-	-	1240			62
M	83	-	14	-	-	1	-	-	-	-	13	-	2	-	500	34	37	15
	89	1	4	-	-	-	-	-	-	-	5	-	-	-	166	46	31	5
	97	-	8	10	-	-	-	-	-	-	18	-	-	-	360	52	62	18
	02	-	-	2	-	-	-	-	-	-	2	-	-	-	40	42	53	2
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	1	1	-	-	-	-	-	-	2	-	-	-	66			2
	97	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	1	-	-	-	-	-	-	1	-	-	-	20			1
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	660			33
% Plants Showing		Moderate Use		Heavy Use		Poor Vigor		%Change										
'83		81%		00%		10%		-62%										
'89		63%		13%		00%		+59%										
'97		50%		34%		00%		+51%										
'02		00%		05%		00%												
Total Plants/Acre (excluding Dead & Seedlings)											'83	700	Dec:	0%				
											'89	265		25%				
											'97	640		3%				
											'02	1300		2%				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Artemisia nova																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	2	3	-	-	-	-	-	-	-	-	-	-	-	100	15	27	5
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	6	28	0
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	1	-	-	-	-	-	1	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'83		00%				00%				00%								
'89		00%				00%				00%								
'97		50%				17%				17%								
'02		00%				00%				00%								
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	0%			
												'89	0		0%			
												'97	120		17%			
												'02	0		0%			
Artemisia tridentata vaseyana																		
Y	83	2	-	-	-	-	-	-	-	-	1	1	-	-	66			2
	89	3	1	-	-	-	-	-	-	-	4	-	-	-	133			4
	97	1	-	-	2	-	-	-	-	-	3	-	-	-	60			3
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	7	5	-	-	-	-	-	-	-	10	2	-	-	400	22	25	12
	89	2	3	1	-	-	-	-	-	-	5	-	1	-	200	17	29	6
	97	-	8	6	-	1	-	-	-	-	15	-	-	-	300	27	47	15
	02	-	-	1	-	-	-	-	-	-	1	-	-	-	20	19	30	1
D	83	-	8	-	-	-	-	-	-	-	5	1	2	-	266			8
	89	1	3	-	-	-	-	-	-	-	3	-	-	1	133			4
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	1	-	1	1	-	-	-	-	-	1	-	-	2	60			3
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
'83		59%				00%				09%				-36%				
'89		50%				07%				14%				-23%				
'97		50%				33%				00%				-78%				
'02		00%				50%				50%								
Total Plants/Acre (excluding Dead & Seedlings)												'83	732	Dec:	36%			
												'89	466		29%			
												'97	360		0%			
												'02	80		75%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Atriplex canescens																		
M	'83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'97	-	-	1	-	-	-	-	-	-	1	-	-	-	20	22	37	1
	'02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
		'83				00%				00%				00%				
		'89				00%				00%				00%				
		'97				00%				100%				00%				
		'02				00%				00%				00%				
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	-			
												'89	0		-			
												'97	20		-			
												'02	0		-			
Brickellia californica																		
M	'83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	'97	-	-	-	5	-	-	-	-	-	5	-	-	-	100	21	28	5
	'02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
X	'83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	'97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	'02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
% Plants Showing		<u>Moderate Use</u>				<u>Heavy Use</u>				<u>Poor Vigor</u>				<u>%Change</u>				
		'83				00%				00%				00%				
		'89				00%				00%				00%				
		'97				00%				00%				00%				
		'02				00%				00%				00%				
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	-			
												'89	0		-			
												'97	100		-			
												'02	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cercocarpus montanus																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	97	-	-	1	-	-	1	-	-	-	2	-	-	-	40	55	50	
	02	-	-	1	-	-	-	-	-	-	1	-	-	-	20	71	56	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%										
'89		00%			00%			00%										
'97		00%			100%			00%			-50%							
'02		00%			100%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	-			
												'89	0		-			
												'97	40		-			
												'02	20		-			
Chrysothamnus nauseosus albicaulis																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	60	94	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%										
'89		00%			00%			00%										
'97		00%			00%			00%										
'02		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	-			
												'89	0		-			
												'97	0		-			
												'02	0		-			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Chrysothamnus viscidiflorus stenophyllus																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20		1	
M	83	4	-	-	-	-	-	-	-	-	4	-	-	-	133	19	33	4
	89	5	-	-	-	-	-	-	-	-	5	-	-	-	166	15	27	5
	97	3	-	-	-	-	-	-	-	-	3	-	-	-	60	16	33	3
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20	11	18	1
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	-	-	-	1	-	-	-	-	-	1	-	-	-	20		1	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%			+33%							
'89		00%			00%			00%			-70%							
'97		00%			00%			00%			+ 0%							
'02		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	133	Dec:	0%			
												'89	199		17%			
												'97	60		0%			
												'02	60		33%			

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Cowania mexicana stansburiana																		
S	83	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	83	-	-	-	-	1	1	-	-	-	1	-	1	-	66	67	69	
	89	-	2	-	-	-	-	-	-	-	2	-	-	-	66	75	45	
	97	-	1	3	-	2	-	-	1	-	7	-	-	-	140	65	77	
	02	-	-	1	-	-	1	-	-	-	2	-	-	-	40	44	64	
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	1	-	-	-	-	-	-	-	1	-	-	-	33		1	
	97	-	-	-	-	1	1	-	-	-	1	-	-	1	40		2	
	02	-	-	-	-	-	1	-	-	-	1	-	-	-	20		1	
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	160		8	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
		'83			50%			50%			+33%							
		'89			100%			00%			+45%							
		'97			44%			44%			-67%							
		'02			00%			100%			00%							
Total Plants/Acre (excluding Dead & Seedlings)												'83	66	Dec:	0%			
												'89	99		33%			
												'97	180		22%			
												'02	60		33%			

A Y G R E	Form Class (No. of Plants)	Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total									
		1	2	3	4		5	6		7	8	9	1	2	3	4		
Gutierrezia sarothrae																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	-	1	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	3	-	-	-	-	-	-	-	-	-	3	-	-	60			3
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	2	-	-	-	-	-	-	-	-	-	2	-	-	66	11	10	2
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	5	-	-	-	-	-	-	-	-	-	5	-	-	100	8	12	5
	02	2	-	-	-	-	-	-	-	-	-	2	-	-	40	6	10	2
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	1	-	-	-	-	-	-	-	-	-	1	-	-	33			1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
% Plants Showing		Moderate Use		Heavy Use		Poor Vigor		%Change										
'83		00%		00%		00%		-50%										
'89		00%		00%		00%		+79%										
'97		00%		00%		00%		-63%										
'02		00%		00%		33%												
Total Plants/Acre (excluding Dead & Seedlings)											'83	66	Dec:	0%				
											'89	33		100%				
											'97	160		0%				
											'02	60		33%				
Juniperus osteosperma																		
M	83	-	-	-	1	-	-	-	-	-	1	-	-	-	33	67	81	1
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33	108	79	1
	97	-	-	-	-	-	-	2	-	-	2	-	-	-	40	-	-	2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
% Plants Showing		Moderate Use		Heavy Use		Poor Vigor		%Change										
'83		00%		00%		00%		+ 0%										
'89		00%		00%		00%		+18%										
'97		00%		00%		00%												
'02		00%		00%		00%												
Total Plants/Acre (excluding Dead & Seedlings)											'83	33	Dec:	-				
											'89	33		-				
											'97	40		-				
											'02	0		-				

A G E	Y R	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches) Ht. Cr.		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4				
Rhus glabra cismontana																		
Y	83	1	-	-	-	-	-	-	-	-	1	-	-	-	33		1	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	0	
	89	6	3	-	-	-	-	-	-	-	9	-	-	-	300	39	35	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	35	17	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%			+89%							
'89		33%			00%			00%										
'97		00%			00%			00%										
'02		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	33	Dec:	-			
												'89	300		-			
												'97	0		-			
												'02	0		-			
Rhus trilobata																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	2	-	-	-	-	-	-	-	-	2	-	-	-	40		2	
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0		0	
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40		2	
% Plants Showing		<u>Moderate Use</u>			<u>Heavy Use</u>			<u>Poor Vigor</u>			<u>%Change</u>							
'83		00%			00%			00%										
'89		00%			00%			00%										
'97		00%			00%			00%										
'02		00%			00%			00%										
Total Plants/Acre (excluding Dead & Seedlings)												'83	0	Dec:	-			
												'89	0		-			
												'97	0		-			
												'02	40		-			